THE BRYOLOGIST

VOL. XVII MAY 1914 NO. 3

NORTH AMERICAN SPECIES OF THE GENUS RAMALINA.—PART V

R. HEBER HOWE, JR.

KEY TO THE *Myelopoeae* (concluded) AND TO THE *Ciliatae*.

Thallus black-ciliate	*crinita*
Thallus eciliate	
Thallus papillo-tuberculate	
Laciniae compressed	
Subcanaliculate	
KOH—(?)	*complanata*
KOH+(?)	*denticulata*
Canaliculate KOH+	v. *canalicularis*
Laciniae terete or torulose	
Apothecia small (entire), lateral. KOH+	*attenuata*
Apothecia large (radiate), subterminal.	
KOH—(?)	*Willeyi*
Thallus not papillo-tuberculate, *striate*	*gracilis*

(*A*) Cortex tuberculate, compressed.

Ramalina complanata (Sw.) Ach.

SYNONYMY: *Lichen* (*Physcia*) *complanatus* Swartz, Fl. Ind. occid. **3**: 1911. 1806.

Ramalina complanata Ach. Lich. Univ. 599. 1810.

TYPE: In the Acharian Herbarium, Universitetets Botaniska Institution, Helsingfors, *fide* Dr. Fred. Elfving. The type seems evidently to have been sent to Acharius, as it is not in the Riksmuseets Botaniska Afdelning, Stockhólm, *fide* Dr. C. Lindman.

TYPE LOCALITY: "Jamaicensium."

ORIGINAL DESCRIPTION: "cartilagineus erectus laciniato-ramosus planus pallidus; scutellis sparsis urceolatus concoloribus; glomerulis punctiformibus marginalibus albis." *l. c.*

FIGURE: Swartz, Lich. Amer. *Pl. 10, figs. A-C, a-b.* 1811.

DIAGNOSIS: *Thallus* caespitose, *compressed*, *subrigid*, *striate*, *papillate*, apothecia marginal, spores *curved*. (KOH—?)

DESCRIPTION: *Thallus* caespitose (max. length 5 cm.), subrigid, stramineous to virescent; cortex striate and (margins) papillate; *laciniae* linear, compressed, often canaliculate (max. width 4 mm.), dichotomous, apices attenuate, subterete.

The March number of THE BRYOLOGIST was published March 24, 1914.

THE TYPE OF RAMALINA CRINITA TUCKERMAN

Apothecia common, marginal, concave at length convex, marginate (max. diam. 5 mm.), disk buff. *Spores* ellipsoid, curved (rarely a few substraight), $\frac{9-18}{3-7}$ μ.

CONTINGENT PHASES: Unobserved.

SUBSTRATA: Trees.

DISTRIBUTION: Common in the Austral Zone.

STATIONS: FLORIDA: Jacksonville; Snake Key. TEXAS: Corpus Christi. BERMUDA. SANTO DOMINGO. ST. CROIX ISLAND: Christiansted. JAMAICA: Malvern Hill; Mandeville.

FIG. 1—Distribution of *Ramalina complanata* and *denticulata*.

OBSERVATIONS: This species, distinguished largely by its striate and papillate thallus, was recognized by Tuckerman, who included *Ramalina denticulata* in his description. Nylander recognized *denticulata* of Eschweiler as a distinct species largely on chemical grounds, and his deeply canaliculate variety *canalicularis* he distinguished on the same grounds. *R. complanata* and *denticulata* grow together, as proved by material before me collected in Bermuda, and cannot be separated except chemically, and the positions of the papillations are not at all characteristic, as they occur scattered over the surface and alone on the margins in plants giving the same reactions. It, moreover, is a character that we would hardly suppose to be constant. The somewhat smaller spores attributed to *denticulata* do not agree with those of plants distinguished on chemical grounds. The species is always distinguished by its compressed, papillate thallus.

NOTE: *Ramalina fastigiata* var. *lacerata* Mull. Arg. Flora **74**: 373. 1891. This variety appears to be more nearly related here than with *fastigiata*. It was described from "Mexico prope San Luis Potosi" (type. no. 1025 *Parry* et *Palmer*) as follows: "thallus dense caespitosus, circ. 'pollicaris'; rami superne subpectinatim lacero lacinuligeri, costato-inaequalis et sublaeves et majores hinc inde parce et minute albido-tuberculligeri." *l. c.*

NOTE: *Ramalina denticulata* (Eschw.) Nyl. Eschw. Flora Brasil. **1**: 221. 1833.

The type locality is "arborum ad ripam fluvii Amazonum." This species which except for its chemical reaction is inseparable from *complanta*, is included under the foregoing species. Though in most instances where the reactions differ, there are to be found correlated differentiating morphological characters, in this case no constant diagnostic points of separation have been discovered in the material examined.

This species was described as follows: "thallo caespitoso cartilagineo foliaceo erecto, e laciniis lineari-elongatis subdichotomis utrinque olivaceis longitudinaliter rugosis et lineatis margine aspero-denticulatis, scutellis subterminalibus concavis, disco rubro et carneo-pruinoso." *l. c.*

Ramalina denticulata var. *canalicularis* Nyl.

SYNONYMY: *Ramalina denticulata* var. *canalicularis* Nyl. Recog. mono. Ram. 126 (28). 1870.

TYPE: In the Nylander Herbarium, Universitets Botaniska Institution Helsingfors, *fide* author.

TYPE LOCALITY: "Mexico, Orizaba." Fr. Müller.

ORIGINAL DESCRIPTION: "Differt thallo attenuato et attenuato-ramaso, laciniis (latit. 1 millim. vel minus latis) canaliculatis." *l. c.*

FIGURE: *Pl. VII, f. 1, 2, et 5.*

OBSERVATIONS: Except the type, I have not seen any specimens from our area.

NOTE: *Ramalina subcalicaris* Nyl. Recog. mono. Ram. 138 (40). 1870. This species, the type of which is in the Museum d'Histoire Naturelle, Paris, *fide* author, was defined as follows: "Subsimilis est *Ramalinae canaliculatae* [= *Ramalina canaliculata* Tayl., *sensu* Nyl]., sed sporis curvulis vel subcurvulis (longit. 0.015–23 millim., crassit. 0.005–7 millim.) et apotheciis (calicaribus) majoribus." *l. c.* The type, from "Orizabae" . . . "Mexico," is the only specimen I have examined. The plant is marginally tuberculate and appears, except for slightly smaller spores, to approach closely *R. alludens* of which I believe it will prove to be a synonym. It also strongly suggests *R. denticulata* var. *canalicularis* Nyl., except again for its spores.

NOTE: *Ramalina leptosperm* Nyl. Flora **34**: 412. 1876. This large ellipsoid-spored species was described by Nylander from Cuba. I have not seen any material and can give only his diagnosis, as follows: "thallus pallidus lineari-attenuatus (latit. 5 centimetr. vel altior, latit. 1–2 millim., crassit. circiter 0.1 millim.), canaliculatus (interdum hinc inde marginalibus conniventibus trabeculis tenuibus transversis conjunctis), nitidiusculus, nervoso-rugosus (apicem versus minus rugosus), ramosus, ramulis acutiusculus; apothecia carneo-pallida concava (latit. 1–3 millim.), receptaculo rugoso, marginalia; sporae oblongae rectae, longit. 0.008–0.010 millim., crassit. 0.0025–0.0035 millim.

Specie facie fere *R. canaliculatae*, sed mox distans thallo tenuisve nervoso-rugoso et minutie sporarum." *l. c.*

(*B*) Cortex terete or subterete-linear (*Teretiusculae* Wain.)

Ramalina attenuata (Pers.) comb. nov.

SYNONYMY: *Physcia attenuata* Pers. Annal. Wettau. Gesell. Nat. **2**: 18. 1810.
Ramalina rigida Ach. Synop. Meth. Lich. 294. 1814.[1]
Ramalina gracilis (Pers.) Nyl.
In part *Ramalina rigida* of Tuckerman.

TYPE: In the 's Rijks Herbarium te Leiden, Holland, *fide* author.

TYPE LOCALITY: "Insulae St. Domingo."

ORIGINAL DESCRIPTION: "Pallens, laciniis attenuatis tenuibus teretiusculis scutellis planiusculis sessilibus.

Ex eadem regione cum priore (*P. straminea*, St. Domingo), hanc Physciam habeo, quae Usneam *hirtam* non male refert. *Lorula* sensim attenuata, scutellis vix marginatis angustiora sunt."

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[1] "Thallo-glabro tereti ramoso sordide albo-pallescente, tuberculis sorediformibus adsperso, ramis complicatis tortuosis attenuatis," *l. c.*

FIGURE: Annal Wettau. Gesell. Nat. **5**: *Pl.* 10, *f.* 7. 1810.

DIAGNOSIS: *Thallus* caespitose, terete, rigid, apices filiform, apothecia *small*, lateral.

DESCRIPTION: *Thallus* caespitose (max. alt. 4 cm.), rigid, virescent; *cortex* striate; *laciniae* branched, dichotomous, terete, apices filiform. Apothecia common, small (max. diam. 2.5 mm.), lateral, convex, marginate, disk buff. *Spores* subfusiform, straight, $\frac{18-21}{6-7.5}\mu$.

CONTINGENT PHASES: Unobserved.

SUBSTRATA: On trees and shrubs.

DISTRIBUTION: West Indies.

STATIONS: CUBA. JAMAICA. PORTO RICO.

OBSERVATIONS: This species, so long attributed to our area, was in the main elucidated by Mr. Merrill. Nylander's conception was not correct, and it seems doubtful if he ever studied the type. *R. rigida* was described by Acharius from Santo Domingo, based on Persoon's MS ("Secundum specimen olim missum") *Lichen rigidus* and called "synonymon est" by Acharius with Persoon's published *attenuata*. The words "tuberculis sorediformibus adsperso" of Acharius' description are not true of the Persoon type now in existence,—perhaps they were true of the "Secundum specimen." This, however, does not affect the case in lieu of Acharius' synonymy. His type locality also is as for *attenuata*. It is a loosely caespitose, slender, terete, *non*-papillate species with *small lateral* apothecia and subfusiform spores. Its reaction with KOH is positive.

NOTE: *Ramalina gracilis* (Pers.) Nyl. Pers. Gaudich. Voy. Uran. 209. 1827. TYPE LOCALITY: "Brasilia (Rio Janeiro)." ORIGINAL DESCRIPTION: "parva, ramis tenuissimis teretibus attenuatis, scutellis lateralibus." *l. c.* FIGURE: Mey. et Flot. Nova Act. Nat. Curios. **19**: Suppl. **1**: *Pl. 3, f. 2.* 1843. OBSERVATIONS: This species is in my opinion identical with the foregoing species. *R. gracilenta* Fr. is not a plant of our area so far as observed. It is distinguished by *fusiform* spores.

Ramalina Willeyi sp. nov.

SYNONYMY: In part *Ramalina rigida* sensu Tuck.

TYPE: *No. 746*, in author's herbarium.

TYPE LOCALITY: Nonquitt, Mass.

ORIGINAL DESCRIPTION: Thallo solido caespitoso, cartilagineo, rigido, ramis torulosis, teretibus, tubercularis, apicibus attenuatis; apotheciis magnis, terminalibus, calcaratis aut radiatis; sporae ellipsoidae.

FIGURE: Howe, Common and Conspicuous Lich. N. Eng. Pt. 1, *Pl. 1*, *f. 3*. 1906.

DIAGNOSIS: *Thallus* caespitose, terete or subterete, *rigid*, *tuberculate*, apices filiform, apothecia *large*, *spurred* or *radiate*.

DESCRIPTION: *Thallus* caespitose (max. alt. 7 cm.), rigid, virescent; cortex nitidous, tuberculate; *laciniae* branched, dichotomous, subterete, not uncommonly compressed below (max. diam. 2 mm.), often torulose-angulate, apices filiform. *Apothecia* abundant, large, mostly subterminal and spurred (rarely

radiately spurred like an *Usnea*), concave at length convex, marginate, finally immarginate and lacerate (max. diam. 6 mm.), disk buff. Spores ellipsoid, straight, $\frac{9-16}{6-8}\ \mu$.

CONTINGENT PHASES: (*a*) Blackening. (*b*) Reduced.

SUBSTRATA: On trees (*Juniperus*) and shrubs, rarely on old wood.

DISTRIBUTION: Not uncommon in the Austral Zone, extending just to the base of the Transition on the Atlantic seaboard and islands from Massachusetts to Mississippi.[1]

STATIONS: MASSACHUSETTS: Brewster; Nantucket; Vineyard Haven; Hyannis; Fair Haven; Onset; Cotuitport; Woods Hole; Wellfleet; Wareham; Horse Neck Beach; Fort Phoenix; Clark's Point; Dartmouth; Mattapoisett; Nonquitt; West Chop. RHODE ISLAND: Middletown. CONNECTICUT: Seaside. NEW YORK: Eastport. NEW JERSEY: Alco. FLORIDA. MISSISSIPPI: Cat Island.

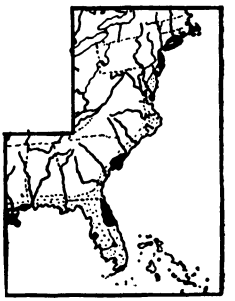

FIG. 2.—Distribution of *Ramalina Willeyi*.

OBSERVATIONS: This species, evidently a near relative of *R. complanata* as judged by cortex and spores, is distinguished by its generally terete and tuberculate laciniae and large subterminal spurred apothecia. The characteristic habit of the plant as it grows in spherical, rosette-like tufts on the twigs of *Juniperus* serves to distinguish it *in situ* from other *Ramalinas*. It has plainly never been described, through a long confusion, and, therefore, I propose for it here a new name, given in honor of Henry Willey, because of the abundance of the species in the region in which he collected; the type locality being one of his favorite collecting grounds.

R. tenuis[2] Tuck was made a synonym of *R. gracilenta*.[3] by Nylander, as it may be, both having fusiform spores. *R. gracilenta*, as compared with *R. gracilis*, is not a compressed species although placed by Dr. Zahlbruckner under Wainio's *Compressiusculae*. It was suggested by Mr. Merrill that *R. tenuis* should be revived for the present species, but though Tuckerman did not mention the spores in his diagnosis, material determined by him as *tenuis* shows fusiform spores $\frac{17-23}{3.5-4}\mu$ and cannot be separated from *R. Montagnei* De Not. Tuckerman later made his *tenuis* synonymous with *rigida*, but his understanding of the entire group is impossible of elucidation.

R. rigida (=*attenuata*) is the West Indian species bearing *small*, lateral apothecia with small subfusiform spores.

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[1] BRYOLOGIST **9**: 32, 48. 1906.

[2] Amer. Journ. Sci. and Arts **25**: 423. 1858. TYPE LOC.: "Blanco, Texas."

[3] NOTE: TYPE LOC.: Cochinchina ORIG. DESCR.: "crusta e granuloso leprosa cinerascente, apotheciis oblongo-globosis carneis cinerascenti-pruinosis, stiptibus longissimis gracilibus nigricantibus." Ach. in Vet. Ac. Handl. p. 289. 1816.—*See* Ach. Lich. Univ. 243. 1810, and Fries Lich. Europ. ref. 383. 1831. =*Coniocybe gracilenta?*

"Thallo rigido filiformi subramoso glauco, costis elevatis longitudinalibus anguloso, apotheciis ateralibus, disco lacteo." Fr. Lich. Europ. reform. **29**: 1831.

Mr. Merrill states that "No American specimens of the *R. rigida* (= *R. Willeyi*) stock have yet been examined showing a medullary coloration on application of KOH." This, again, distinguishes it from the foregoing species, though I have found examples that show a distinct coloration. Dr. Herre recorded *rigida* from the California coast (Proc. Wash. Acad. Sci. **7**: 335, 1906, and **12**: 221. 1910), but an examination of his material does not permit me to include it here; it appears to be a rather young and as yet esoraliate state of *R. farinacea*, the plant often determined as the variety *minutula* Ach. Dr. Eckfeldt also records it from Labrador and Newfoundland, seemingly erroneously, and records from Cuba and Jamaica are referable to the foregoing species. Mr. Merrill has remarked that *R. canaliculata* Fr. is also often mistaken for this species. Small states, otherwise typical, are frequently met with from Florida (phase *b*).

EXSICCATI: *No. 199.* Decades N. Amer. Lich. Cummings, etc. Brewster, Mass., Nov. 10, 1894. *L. A. Crocker.*

No. 129. Lich. Boreali-Amer., Cummings, etc. "Brewster, Mass." Nov. 10, 1894. *L. A. Crocker.*

No. 105. Lich. Univ. Lojka. "Massachusetsiensi Americae Borealis, 1885." *H. Willey* (topotype).

No. 51. Lich. Cuba. Wright *fide* Tuckerman (?)

No. 51. Lich. Novae Angliae. *Howe.* Westport Harbor, Mass., Aug. 21, 1913 (topotype).

All the above are called *R. rigida.*

NOTE: *Ramalina rigida* var. *dendroides* Nyl. Recog. mono. Ram. (14) 112. 1870. This form, or variety, has been recorded (Hue, Lich. Exoti., 261. 1890) from the Antilles. I have seen no material, and can add nothing to our knowledge of the plant from within our area, though it seems hardly separable from *R. complanata.* It was described as follows: "thallo compresso (altit. 8–12 centim., latit. basi circiter 1 millim., crassit 0.5 millim. vel tenuiore) rigente dendroideo-ramoso et ramuloso, etiam ibidum occurrit." Type *No. 460.* Coll. Husn. from "Martinica."

Ramalina dendriscoides Nyl. Flora **34**: 412. 1876. This Cuban species I have not observed. It was defined as follows: "Thallus pallidus subnitidiusculus minor gracilis (altit. 2–5 centimetr., crassit. 0.5–0.6 millim. vel gracilior), teretiusculus, dendroideo-ramosus et ramulosus, ad axillas interdum vage impressus, ramulis saepe apicibus albo-sorediosis. Apothecia non visa. Datus. No. 738.

Species videtur propria accedens ad *R. rigidam* vel saltem ejus stirpem. *R. dendroides* (Del. Nyl. *Ramal.* p. 14) differt jam thallo majore, laciniis compressis et defectu sorediorum terminalium ramulosum. *R. sorediantha* comparari forsan etiam possit ob soredia, sed haec species thallum non habet teretiusculum (sed canaliculatum, etc.)." *l. c.*

Ramalina camptospora Nyl. Recog. mono. Ram. 120 (22). 1870. This species, of which I have seen only the type at Paris, was described by Nylander from Cuba as follows: "Thallus stramineo-pallidus compressus tenuis (basi latit. 1 millim. vel magis attenuatus) linearis, lineari-divisus et ramis utroque

margine ramulosis; apothecia luteo-testacea pallida (latit. 2 millim. vel minora), receptaculo laeviusculo (margine integro vel subcrenulato); sporae ellipsoideae vel ellipsoideo-oblongae, curvatae, longit. 0.012–17 millim., crassit. 0.006–8 millim." *l. c.*

SERIES: **Ciliatae** ser. novo.

Medulla arachnoid, cortex thick (80–105μ) hyphae divaricate above gonidia, externally black ciliate.

Ramalina crinita Tuck.

SYNONYMY: *Ramalina crinita* Tuck. Bull. Torr. Bot. Club **10**: 43. 1883.

TYPE: In the Sprague herbarium, Boston Society of Natural History, Boston, *fide* author.

TYPE LOCALITY: "San Diego, California." *C. R. Orcutt*, March, 1863.

ORIGINAL DESCRIPTION: "Thallus caespitose, rigid, compressed, subdichotomous, linear-laciniate, at length much dilated, greenish-glaucous, the divisions smooth, interruptedly white striate, and becoming lacunose, attenuate at the summits, and clothed at the margins more or less thickly with strong, solitary or clustered, finally branched, black fibrils; apothecia middling-sized to large (3–10 mm. in width), subterminal and lateral, subpodicellate, varying as to smoothness as the thallus, the margins blackened; spores oblong-ellipsoid, $\frac{15-20}{5-6}$ mic." *l. c.*

FIGURE: *Pl. VIII, f. 1.*

DIAGNOSIS: *Thallus* caespitose, compressed, *rigid*, beset with *black fibrils*, apothecia marginal, spores straight.

DESCRIPTION: *Thallus* caespitose (max. length 8 cm.), *rigid*, virescent; *cortex* striate, sublacunose, ciliate with black fibrils; *laciniae* compressed, expanded, subdichotomous (max. width 20 mm.), apices attenuate. *Apothecia* lateral or subterminal, concave, marginate, margins black-edged (max. diam. 10 mm.), disk concolorous. *Spores* ellipsoid, straight, $\frac{15-20}{5-6}\mu$.

CONTINGENT PHASES: Unobserved.

SUBSTRATA: On trees.

DISTRIBUTION: Common in the Austral Zone in southern California and Lower California.

STATIONS: CALIFORNIA: Point Loma; San Diego. LOWER CALIFORNIA: Todos Santos.

OBSERVATIONS: This remarkable and easily recognized *Ramalina* has a very local distribution. Its black ciliate laciniae at once distinguish it from any other species.

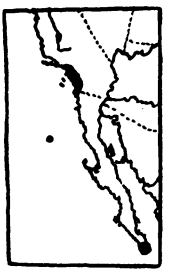


FIG 3.—Distribution *Ramalina crinita.*

EXPLANATION OF PLATES VII AND VIII.

Plate VII.

1. The Nylander type of *Ramalina subcalicaris* at Paris (nat. size).
2 and 5. The Nylander type of *Ramalina denticulata* var. *canalicularis* at Helsingfors (much reduced).

3. The Swartz type of *Lichen complanatus* at Helsingfors (reduced).
4. The Persoon type of *Ramalina rigida* (*Physcia attenuata*) at Leiden (slightly reduced).

Plate VIII.

1. The Tuckerman type of *Ramalina crinita* at Boston (nat. size).

NOTES ON MAINE HEPATICAE AND THEIR COMPARISON WITH THE HEPATICAE OF THE SAREKGEBIRGE. (Concluded)

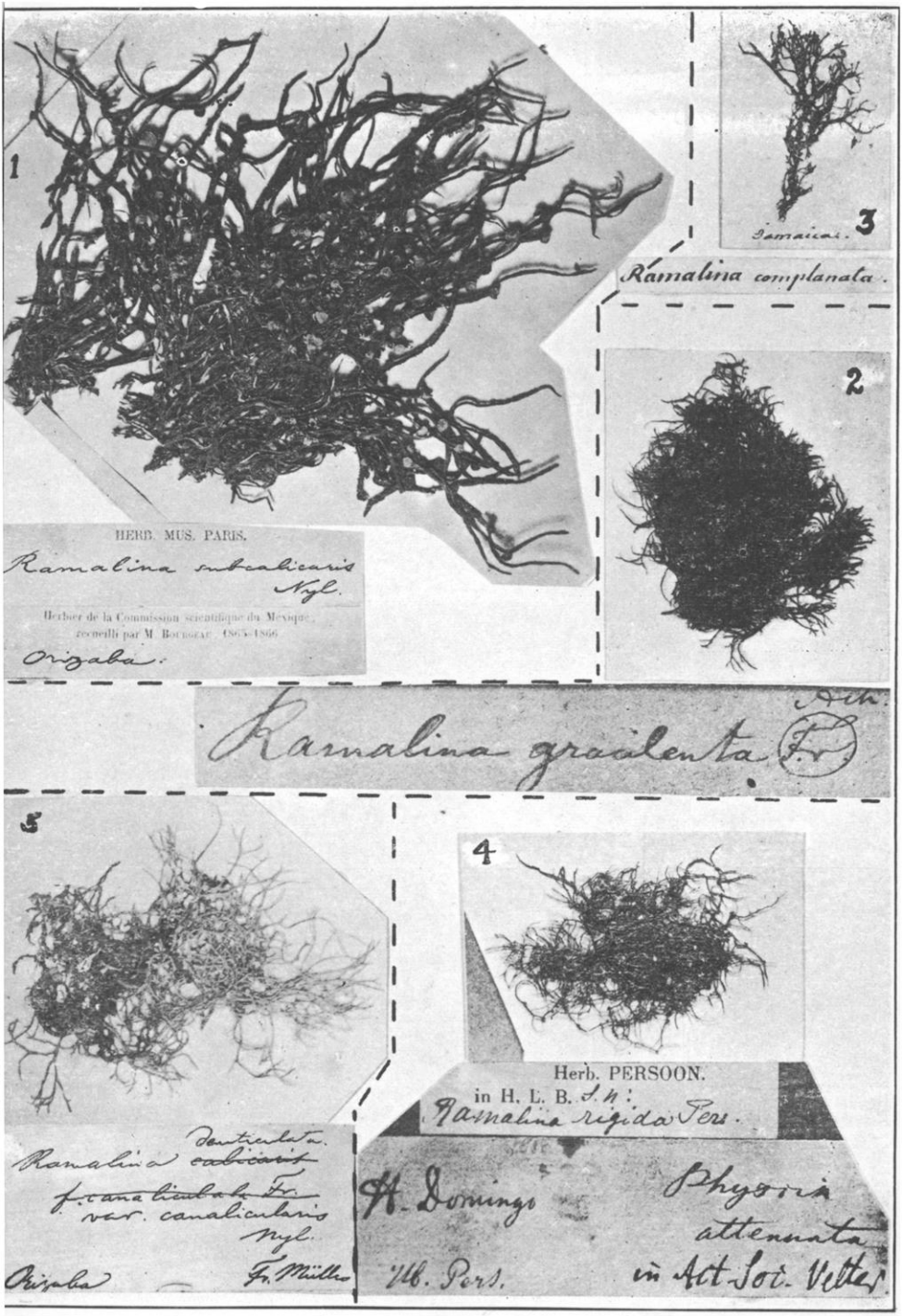
ANNIE LORENZ

The higher altitude at Round Mountain Lake, as compared with the White Mts., as well as its more northern location, is evident from a glance at some of the hepatic inhabitants. *Lophozia lycopodioides* and *L. attenuata* are abundant about the edge of the lake, whereas in the White Mts. the former does not descend below 4000 ft., and the latter fortunately is chiefly confined to 2500 ft. or more, although occasionally descending much lower. *Pallavicinia Flotowiana* grew quite abundantly on the rocks at the water-line on Tree Island, both ♀ and ♂ plants, and it was mixed with *Pellia*.

There apparently were no good sphagnum bogs in the vicinity; at least, none of the inhabitants seemed to know of any, as what they called "bogs" were what are known as "stillwaters" in the Adirondacks, although sphagnum was common enough. However, just outside Eustis, on the way in, the writer noted a most promising little bog full of Andromeda, which shall be investigated next time.

The most unusual feature of the region is Big Alder falls and gorge, about 3 miles from camp. Alder Stream, the outlet of Big Island Pond, flows through about a mile of cañon, with a high falls at the upper end. The gorge runs approximately east and west, and is about 75 ft. deep. The rocks forming its walls contain some magnesium; there is a seam of low-grade asbestos crossing the road just above the gorge. This region, in fact, is southeast of the Black Lake mines in Quebec. The writer has explored only about the foot of the two paths leading respectively to the head and foot of the falls, but the results were encouraging to further exploration. On the first trip, the writer, not knowing about the Mg in the rocks, made out a list of such species as grow on granite at the Waterville, N. H., cascades, and could not at first see what had become of most of them, especially of *Marsupella*. Down the first path the only species of value was *Scapania subalpina*, new to the state. Near the second path, the writer gathered a handful of something which upon examination proved to be *Lophozia heterocolpa* (Thed.) Howe, new to New England. It was growing about tree-roots on the bank, where it was rather dry.

On a second trip down this path, in search of more *L. heterocolpa*, plenty of it was found where it grew in company with *Plagiochila*, *Nardia hyalina*, *Mnium* sp., etc., but the chief find was *Lophozia obtusa* (Lindb.) Evans, on the same


1
HERB. MUS. PARIS.
Ramalina subcalicaris Nyl.
Herbier de la Commission scientifique du Mexique
recueilli par M. Bourgeau 1865-1866
Orizaba.
Jamaica. 3
Ramalina complanata.
2
Ramalina graëlenta. Ach. Fr.
5
Ramalina denticulata. cabrerae
f. canaliculata Fr.
var. canalicularis Nyl.
Orizaba Fr. Müller
4
Herb. PERSOON.
in H. L. B. Sn:
Ramalina rigida Pers.
St. Domingo
Physcia attenuata
Ach. Pers.
in Act. Soc. Vetter.